

Application No. 09/589,675

LSCP 1000-1

**TO EXAMINER FARAH VIA FACSIMILE: (703) 746-3368****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of inventor(s):  
**Steven C. Murray et al.**

Application No. **09/589,675**Confirmation No. **8651**Filing Date: **07 June 2000**Title: **Device for Irradiating Tissue**

Group Art Unit: 3739  
Examiner: Ahmed M. Farah

**CUSTOMER NO. 22470****INFORMAL AFTER FINAL COMMUNICATION WITH EXAMINER**

Sir:

In response to the Final Office Action mailed 15 May 2003, and the interview of 7 October 2003, Applicants request that the Examiner consider the following proposed amendments and arguments in the above-referenced application:

In the present application, the claims are limited to systems using fluorescent elements which operate by spontaneous emission, as opposed to lasers which have resonant cavities and operate by stimulated emission, for producing a variety of therapeutically relevant wavelengths of diffuse light inexpensively. In the specification, the inventors stated, "Because the device utilizes fluorescence rather than lasing to generate emitted radiation, the device can be manufactured inexpensively, is significantly less prone to malfunction, and is relatively easy to use when compared to prior art systems utilizing dye lasers." (Page 4, lines 15-20). Although both stimulated emission in lasers and spontaneous emission by fluorochromes can be said to operate by fluorescence, the two mechanisms are substantially different. Attached please find an excerpt from Siegman, LASERS, University Science Books, 1986, pages 22-24, which describes the fundamental differences.

We propose to amend the independent claims 1, 17, 22, 26 and 33, and claim 2, to further emphasize the distinction between lasing, which is based on stimulated emissions, and spontaneous emissions according to the present invention. For example, we propose the following amendments.

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1. (Proposed amendment) A device for irradiating tissue, comprising:  
a fluorescent element positioned to receive pump radiation having a narrow spectral band and responsively generate emitted radiation by spontaneous emission, the spontaneously emitted radiation being diffuse and having peak emission outside said narrow spectral band; and

the fluorescent element being adapted to deliver least a portion of the diffuse emitted radiation toward a tissue target.

2. (Proposed amendment) The device of claim 1, wherein the fluorescent element comprises a fluorescent substance fluorochromes dispersed in a solid medium.

17. (Proposed amendment) A device for irradiating tissue, comprising:  
a fluorescent element positioned to receive pump radiation and responsively generate emitted radiation by spontaneous emission, the spontaneously emitted radiation being diffuse and having substantially different spectral characteristics with respect to the incident radiation; and

a redirector for redirecting at least a portion of the diffuse ,spontaneously emitted radiation toward a tissue target, wherein the redirector comprises a waveguide including a reflective entrance face and reflective walls, the entrance face having a substantially transmissive aperture formed therein for admitting pump radiation into the waveguide.

22. (Proposed amendment) A method for irradiating tissue, comprising the steps of:

directing pump radiation within a narrow spectral band onto a fluorescent element;

responsively generating emitted radiation by spontaneous emission at the fluorescent element, the spontaneously emitted radiation being diffuse and having peak emission outside said narrow spectral band of the radiation; and

delivering at least a portion of the diffuse emitted radiation to a tissue target.

26. (Proposed amendment) A method for irradiating tissue, comprising the steps of:

directing pump radiation onto a fluorescent element;  
responsively generating emitted radiation by spontaneous emission at the fluorescent element, the spontaneously emitted radiation being diffuse and having spectral characteristics substantially different from the incident radiation;  
receiving a portion of the diffuse spontaneously emitted radiation at a redirector; and  
redirecting the received portion of the emitted radiation toward a tissue target, wherein the step of redirecting the emitted radiation includes reflecting the emitted radiation from the boundary between a waveguide core and cladding material, the cladding material having a substantially lower index of refraction than the waveguide core.

33. (Proposed amendment) A system for irradiating tissue, comprising:  
a pump radiation source for generating pump radiation having a narrow spectral band;  
a fluorescent element positioned to receive the pump radiation and responsively generate emitted radiation by spontaneous emission, the spontaneously emitted radiation being diffuse and having peak emission outside said narrow spectral band; and  
a redirector for redirecting at least a portion of the diffuse emitted radiation toward a tissue target.